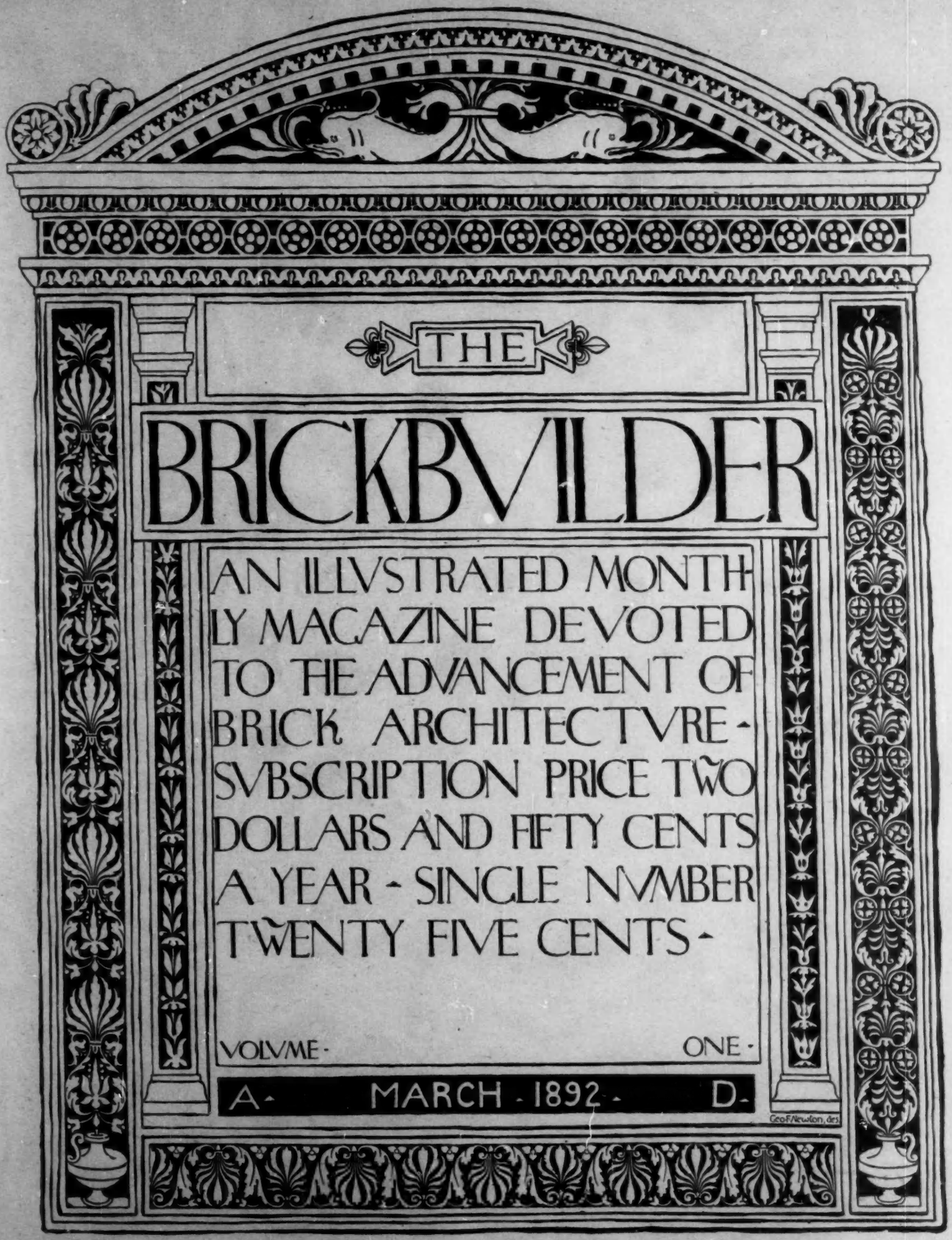
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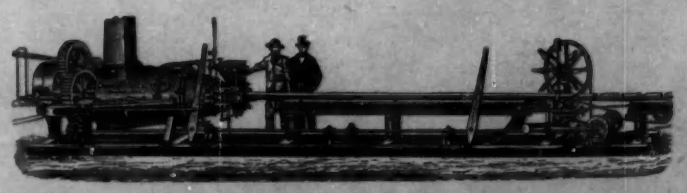

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We remark with pleasure the appreciative notice of THE BRICKBUILDER which appears in *The Architectural Review* of March 14. It is encouraging to have the approval of a journal which is rapidly becoming the recognized authority in matters of architectural criticism; indeed the only journal in this country which attempts anything like that serious, systematic, and critical review of current architecture, which is so much needed. Whether or no it be true that in multitude of counsellors there is safety, it is certain that when counsellors agree they carry the greater influence, and we are glad to gain for our position that weight and cogency which come from the concurrence of another and so good an authority. The remarks of the *Review* emphasize and supplement so well the views we have expressed in these columns, and which we shall from time to time reiterate as occasion may serve, that we venture to quote them entire: —

"THE BRICKBUILDER has published an excellent initial number, with a series of plates that cannot fail to be useful. There is no field which has been so neglected as that of obtaining good results in brick architecture; and now that the range of color of bricks is practically unlimited, it is possible to obtain results that will compare with the best of the Italian and Spanish brickwork. We are glad to see that THE BRICKBUILDER advocates the adoption of a pressed brick that will bond with the common brick. At present it is not an easy matter to even build a common brick wall with pressed brick quoins. There is one thing which thus far has coarsened and vulgarized brick buildings in which no terra-cotta or moulded brick has been used, and that is that the smallest brick were not sufficiently small or of varied enough shapes to make refined label mouldings, string courses, etc. It will be seen, by a comparison of the plates of Boston and of Italian cornices, that while the former have units of one size only to combine, the latter have units of several sizes and of several shapes. As a result the Boston cornices are comparatively commonplace, crude, and large in scale, while the Italian ones are full of interest and refined. In going over the catalogues of moulded brick in nearly every case, no matter how varied the profiles may be, the size of the bricks is the same throughout. Designing in such a limited scale of parts is therefore considerably hampered; and as in mosaic, there are larger and smaller pieces, so in brick cornices, belts, etc., it would be a positive advantage to have a choice of sizes of units. If, then, there were made small brick, square, triangular, circular, of dimensions which would be divisors of the usual brick for facing the walls, the possibilities of rich design in brickwork would be increased to a practically infinite degree. Such choice of material would not only be acceptable to architects, but would stimulate the ingenuity of the mason (for ingenuity enters largely into the design of a brick cornice), and anything that aids in developing interest or enthusiasm in the workman cannot be too greatly desired. Mr. Warren's 'Neglected Considerations in Regard to Brick Architecture' is most excellent. He states the case thoroughly and to the point. We only wish that all architects would insist upon the considerations he mentions. It is a mere matter of prejudice, a desire to avoid what has seemed acknowledged cheapness, that have made the public object to common brick. In fact, there are no pressed brick buildings older than one hundred years, and why the same people who admire the brick buildings of Europe should fail to employ the same material here is a subject for inquiry."

We agree entirely with the statement that there is great need of a variety of sizes and shapes of brick, especially for label mouldings, string courses, etc., and this not only in moulded, but also in plain brick; nor does this militate in any way against the adoption of a standard size. As the *Review* suggests, the dimensions of the smaller sizes should be divisors of the standard size bricks. The brickmakers might with advantage give us also moulded brick of the so-called Pompeiian or Roman size. Such a series of mouldings would be a valuable addition to those already at command. The conclusions which the *Review* draws from a comparison of the Boston and Italian cornices published in our first number are, perhaps, more striking in the comparison of windows shown in our last and also in the present number, though in these instances the results in the modern case are not so disastrous. When we see the old Italian window and its nearest modern equivalent, according to the brick catalogues, side by side, the most obvious fact brought out by the comparison is the equality in size of all the parts in the modern example, and the great variety in size in the ancient one. This is noticeable both in the comparative designs which we publish in this number and which we gave in the last, and it is obvious that the ancient examples gain from this very cause. But we do not believe that the coarseness and vulgarity due to want of proper scales in simple modern brickwork have been due entirely to a want of variety in the material at hand. Had our designers felt the want as they should, they would have found some way out of the difficulty.

For instance, tiles of varying thickness are generally easily obtainable, and, by using one or more projecting courses of tiles together, a great variety of strings and label mouldings of different thicknesses can be produced at little expense, and even very effective dentil or billet courses. The use of plain red tile in connection with brick can indeed be made to produce a much greater variety of treatment than has yet been attempted. We will mention only one other instance; namely, the use of plain tile, alternately flat in the wall and on edge, to produce a series of sunk panels separated by delicate arrises formed by the edges of the tile projecting from the wall. These are suggestions for the simplest and least expensive treatment, and we are inclined to give especial attention to the simple and inexpensive structures, as it is precisely to these that so little attention has been paid hitherto, when yet a simple and inexpensive building is capable of as much *design* as a more elaborate and costly affair, and if well treated may be really more beautiful than its more pretentious neighbor. Surely anything that is worth doing at all is worth doing well.

and inasmuch as the cheaper buildings must always be in the majority, must always therefore be of the greatest influence in giving its character to any place, it is always worth while for the designer to bestow his best efforts upon them. And this does not mean that they are to be cut up into a multitude of parts or made to strive for what they cannot attain. Let an inexpensive building, above all things, be modest; let it be severely simple, even to baldness if need be; but let its parts be carefully proportioned in relation to each other; let its window openings be grouped as agreeably as may be and be rightly proportioned to the wall-space; let its detail be in scale with the building — neither too coarse nor too fine — and concentrate such modest ornamentation as it may have around the doorway or in the cornice; and, finally, let it be the simple and straightforward expression of its practical requirements, and the result cannot fail to be charming. These elements of beauty the very simplest and most utilitarian of buildings may have and ought to have.

Tile making in this country has certainly not as yet been as successful as we hope it may become, nor need tile roofs be as expensive as at present they are. When the tile makers can furnish a good tile at a moderate price, we do not question that the architects will be quick to adopt it.

It is undoubted that the tile roof is in appearance the most beautiful of all roof coverings, and that it is capable of more artistic treatment than it has received as yet in this country. We have but to look at drawings of ancient Greek or Japanese tile roofs to feel assured of this fact. It is encouraging, however, to notice signs of great improvement in this direction. Among the tiles most recently put on the market, we have seen with pleasure those made by the Celadon Terra-Cotta Co., of Alfred Centre, N. Y., as being one of the most beautiful roof coverings we know, and which should, we think, prove to be a durable and water-tight tile, even in our severe climate. The care bestowed upon the design of the eaves-tiles and hip-rolls, some of which show evidence of the study of Japanese originals, is especially to be commended. But in cost, these tiles are no exception to the expensiveness of our American tiles.

In several quarters there exists a prejudice against brickwork, which one encounters once in a while when least expected, a prejudice often as obstinate as it is unfounded. Because brickwork happens to be comparatively inexpensive, it is by some ignorantly supposed to be deprived of all other virtues. Being cheap it is assumed that it cannot be beautiful, when yet it is as capable of beautiful treatment as any other material, and is as worthy of excellent design. Then, strangely enough, it is maintained that it is not durable, when yet it is the most indestructible of all building materials. We have heard it stoutly asserted, especially with regard to moulded brick, that it lacked durability, and this as if moulded brick were a new material, a recent fad. But moulded brick is no experiment; nor need one go to the walls of Babylon, or to the buildings of four, five, or six hundred years ago in England, Italy, or the Netherlands, in order to be sure of the permanence of moulded brick. The Eastern States of our own country are not without fine examples of a simple and modest but excellent brick architecture, dating back from one to two hundred years, in which moulded brick is frequently employed. Such are the older buildings of Harvard College, the Old South Church in Boston, the old Swedes Church and Christ Church in Philadelphia, besides numbers of mansions about Philadelphia and all through Virginia, and in the Dutch settlements of New York and New Jersey. The brick used in these buildings is, of course, handmade, and most of it was imported from England, or, in the case of the Dutch settlements, from Holland. An examination of these buildings would quickly set at rest any question as to the durability of brickwork.

But a great deal of bad brickwork has been put up of recent years, and to this, doubtless, is in large measure due the prejudice of which we have spoken. There being in brickwork so many more joints than in stone masonry, the quality of the mortar in brickwork is of far greater importance. If the mortar is poor and disintegrates, and the building crumbles into the small parts of which it is made up, it becomes of little consequence that these small parts are themselves of such a durable nature. The best cement mortar is none too good for brickwork that is intended to be permanent, especially in this climate, and it is to the truest interests of the brick masons as well as of the architects, to see to it that the best mortar is always employed. It is especially important that the projecting courses are laid in cement mortar. Another point of importance to the durability of brick walls is that they should be properly protected at the top with an overhanging course with a drip either of salt-glazed terra-cotta, or stone, or even a mere board covered with tin. These are elementary points, but they are only too often neglected.

It is true, of course, also, that there are, especially in some sections of the country, too many bricks of a very poor quality, soft and therefore not durable. Too much care cannot be exercised by builders in selecting brick. If we are to have a good brick architecture, if brickbuilding is to become what it may become, the first thing is to have brick of good quality, and the next to see to it that the mortar and the workmanship are of the best. Without these brickbuilding will rapidly come into disrepute, and the finest designing will be futile. It is the too frequent want of these that has given color to the prejudices to which we have referred.

There is another moral we are inclined to draw, suggested by the studies we were obliged to make in preparing for the comparative plates we are publishing of features of ancient brick architecture, with their possible modern equivalents, and that is with regard to the character of the mouldings themselves, which our plates are on too small a scale to clearly show, but which are none the less important in the effect of the executed work. It would be just as cheap to make good mouldings as bad ones, refined mouldings as vulgar ones, interesting mouldings as stupid ones, once the original models and forms were made. And yet an examination of most of the brickmakers' catalogues reveals the fact that they have been copying from each other, and perpetuating a series of the poorest and most commonplace mouldings it is possible to imagine, mouldings which had their origin in this country at a time when architectural design with us was, perhaps, at its lowest ebb. Except in the case of simple beads or quarter rounds and quarter hollows, geometrical forms in which it was hardly possible to go astray, the mouldings are in most of the catalogues coarse in feeling, poor in line, and almost hopelessly vulgar, and, what is remarkable, the same bad mouldings appear in catalogue after catalogue, copied apparently from some unfortunate original.

The want of refinement is of course most apparent in the ornamented members. The egg and dart mouldings, for instance, are in most catalogues quite without any beauty. Why cannot the brickmakers throw away their old moulds and get really good designers to draw them some really good mouldings and some really good modellers to model them? It would cost a little at the outset (especially as good designers and modellers are paid more than poor ones), but it would pay in the long run. There are one or two companies, indeed, which stand head and shoulders above the rest in this respect, and, provided the quality of their brick is as good, they cannot fail in the end to get the best class of trade. We hope to see the

example of these companies followed, and would suggest to the more enterprising moulded-brick companies that they might with advantage institute a competition with adequate prizes and competent judges for the best series of brick mouldings of given sizes. THE BRICKBUILDER would be glad to aid any such enterprise in any way in its power. We have all the mouldings of the past to copy from or to use as suggestion, and there is no reason why brick mouldings to-day should not be made as beautiful as ever they were. The brickmakers have done wonders of late in giving us a most beautiful series of colors in brick, but have in most cases neglected to make any improvements in their mouldings. Let them look to their catalogues!

In the *American Architect* for April 23, Prof. Morse concludes his instructive series of articles "on the older forms of terra-cotta roofing tiles." The articles reveal the fact that the vastly larger majority of the civilized human race live under tile roofs. In the last article is an interesting map showing the distribution of tiles of different forms throughout Europe. Prof. Morse classifies the tiles of the world according to their forms, and gives brief descriptions of the forms of tile that have been in use in different countries. The ancient Greeks and the Japanese stand out pre-eminent as the peoples that have made the most artistic use of tile roof coverings, and who have bestowed most thought upon the treatment of the roof. And as Prof. Morse points out, especially in the case of a tiled roof in Nagasaki and the roof of the temple of Hera at Olympia, there are striking resemblances between these roofs, "separated by nearly three thousand years in time and thousands of miles in space." Prof. Morse regards the ancient Greek tiled roof as originally derived from the far East. The paper is full of suggestions for tile makers. We would call especial attention to the following remarks on the curious infrequency of tile roofs in the United States: —

"We have seen in the course of this paper that in all parts of the world outside of savage areas and under all climatic conditions people shelter themselves beneath roofs covered with terra-cotta tiles. With this wide dispersion of roofing-tiles, however, there still remains a territory extending from the Atlantic to the Pacific, embracing Canada and the United States, which is virtually destitute of this ancient form of roof-covering. It is a curious fact that a material so cheap, durable, and picturesque, and one so widely distributed throughout the world, should not have effected a lodgment in this country. It seems all the more singular when it is considered that the early colonists — Spanish, Dutch, French, English, German — all came from tile-using countries. This curious condition of things can only be accounted for by the fact that at the outset wood was so much cheaper than any kind of baked clay that it was used in the form of clapboards and shingles to the exclusion of other material, and thus the habit finally became ingrained."

"Within recent years pantiles and flat tiles have been manufactured and used in this country. Their use has been mainly confined to large structures, not for the sake of economy or utility, but for architectural effect. Such roofs have been far more expensive than similar ones in Europe, and judging from the trouble many of these roofs have given, it is quite evident either that the right kind of tile has not been made or that it has not been properly applied to the roof. From the frequent breaking of the tiles it has been supposed that our climate, with its rigorous changes, was the cause of this. I have observed, however, in Europe, that tiled roofs are quite as common in regions north of the line of frost and snow as below that line. In England the effect of frost is spoken of as being unfavorable to tiled roofs. Despite these drawbacks, it would seem that the terra-cotta tile, when properly made and adjusted, is one of the cheapest and most durable of roof-coverings, as it is certainly one of the oldest and widest distributed."

"Acting as a non-conductor, the upper portion of the house is warmer in winter and cooler in summer. Slate roofs absorb and transmit a good deal of heat. Shingle roofs are a menace in times of conflagration. With the best tile clays in the world and an abundance of the rude labor usually employed in tile-making, there is no reason why roofing-tiles should not come into common use in this country, as they have in all other parts of the world."

The *Thonindustrie-Zeitung* is quoted by the *American Architect* as stating that where the efflorescence on bricks is caused by lime in the clay of which they are made, it can be prevented by dipping the bricks in dilute hydrochloric acid just before burning.

"If the clay contains much lime the acid should be weak; if the proportion of lime is small, it may be stronger, the point being to keep the acid so dilute as not to injure the bricks by a rapid disengagement of bubbles of carbonic acid from the clay. With the average clay, a mixture of one part commercial hydrochloric acid with forty of water answers well. Forty quarts of water are put into a cask, and one quart of acid added. This will give acid enough for dipping five hundred bricks. The bricks, when thoroughly dried in the air and ready for burning, are dipped for a second in the cask of acid, and then dried again and burned in the usual manner. After five hundred bricks have been dipped the liquid will be exhausted, and a fresh solution must be prepared. The bricks so dipped burn with a clear, even color, very suitable for face-bricks. In Germany, the operation adds only twelve cents per thousand to the cost of the bricks."

It is curious to observe that while the *Thonindustrie-Zeitung* says that the efflorescence is generally due to lime in the clay, Prof. Baker in his work on "Masonry Construction" states that it "generally originates with the mortar." It is probably as often due to the one cause as to the other. It is at any rate so often due to the mortar that treatment of the bricks before burning alone will not often be sufficient to prevent it. Prof. Baker recommends the use of Sylvester's method of repelling moisture from the surface of the walls by applying alum and soap washes alternately on the outside of the wall. Water absorbed by the wall from the mortar or during rain dissolves the salts contained in the brick or mortar, and on evaporating, deposits them as a white efflorescence on the surface. If the wall, by Sylvester's or any other method, is made impervious to water, this desposit is prevented. Prof. Baker also recommends as cheaper than Sylvester's washes, making the mortar impervious to water, by adding one per cent by weight of powdered alum to the dry cement and sand, and thoroughly mixing, and dissolving about one per cent of any potash soap in the water used in mixing the mortar. This method can also be used with lime mortar, though with less advantage. It of course prevents the efflorescence only in so far as this is due to absorption of water from the mortar, or from salts in the mortar. Other methods of preventing efflorescence by waterproofing walls are by Cabot's wash, and by Caffall's process of heating the walls and then coating them with a preparation of paraffine, which penetrates to the depth to which the heat has penetrated. Lately Mr. H. C. Standage, writing in *The Builder*, suggests that the proper remedy is the application of hydrochloric acid or a solution of common salt to the bricks, in order that by chemical action the salts which form the efflorescence may be converted into soluble salts and washed away by the rain. As the common salt is much cheaper than hydrochloric acid, he suggests that the bricks should be dipped in such solution before being laid, or well washed with it afterward. This whole subject, and the various methods of prevention and their comparative merits, need more thorough investigation than they have, so far as we know, as yet received.

A PLEA FOR PERFECTION IN BRICKWORK.

The perfect in building construction may be said to be reached when there is obtained a maximum of strength and durability at a minimum cost. To design a roof, a floor, or a wall that shall be strong enough to carry the load to be placed upon it, and strong enough to resist the thrusts that may be put upon it, is simple enough; the problem is to design in such a way that the portion of the structure is exactly strong enough and no stronger than is required; in other words, that there is no waste.

Having these facts in mind, it is easy to understand why there is so great a difference between carpentry in the United States and in England, and some parts of Europe. In this country timber is cheap and labor comparatively dear, while in England the reverse is true, and labor is cheap and timber comparatively dear. Adding the expense of freight to American timber used there, the cost will be somewhat more, while labor costs in round figures only about one half of what it does here. These facts affect and regulate construction to a very great extent, and what would at first sight appear to an English carpenter faulty and wasteful construction, is simply the result of a desire to save time; in other words, material is sacrificed for saving of labor.

These facts are equally true as far as brick construction is concerned, and it is doubtless due simply and only to the desire to save time that the imperfect, faulty, and altogether wasteful method of laying bricks in "running" or "American bond" has come into general practice. It has been suggested in these columns that the fact of face bricks being of a different size to those on the interior of the wall is responsible for the use of the bond, but the writer thinks that this does not by any means explain it all, although it may to some extent. There is no reason in the world why the back of a wall, whatever the sizes of face and back bricks may be, should be laid in running bond.

Now, in the construction of buildings as in other things, it is often profitable to closely and critically examine the methods followed elsewhere to ascertain whether they may not be adopted with advantage here. It is certain that no part of a building deserves perfection in construction, so to speak, so well as does brickwork, and this for the simple reason that no portion is less liable to decay. The best bricks, and this literally means bricks of the highest quality, are exceeded in durability by no known material used in the construction of buildings. Iron rusts; timber decays; stone perishes, and if it be limestone is destroyed by fire quicker than timber; but good brick resists the action of atmosphere, fire, and water, and lasts for ages. The very strength and durability of brick have been the cause of poor brickwork, paradoxical though it may seem.

To construct a brick wall that shall be as strong as possible from the materials at hand would appear to be eminently desirable, but a wall erected in running bond falls short of that by a good deal. That this is true is not difficult to understand. The system of construction violates the most important principle of bonding which is, that no two vertical joints shall come over one another. Suppose that there were no considerations of appearance, why not pile the bricks up one upon the other irrespective of bonding? "Oh," the bricklayer will tell you, "we must get bond,"—he must interlap the bricks to get bond,—to get strength on the face of the wall. Why not get bond through the breadth of the wall as well? That there is a necessity for it will not be denied, for the whole weight of the building rests on the inside portion of the wall, and it is of the utmost importance to distribute this weight through the thickness.

That which comes nearest to a perfect wall is that system of construction known as "English bond," in which the bricks are all laid headers, excepting at the face, in alternate courses, where they are laid stretchers. This system of construction produces a wall in which the fundamental principle of bonding is closely adhered to, and it will be found that, when it is faithfully carried out, no two mortar joints, in any part, come over one another. Flemish bond, although less perfect from a constructional point of view, is very considerably stronger than running or American bond, while its appearance is generally acknowledged to be very much superior.

Now, while the strength of a wall erected in English bond is very considerably stronger than one built in running bond, it is a fact to which due regard must be paid that the latter effects a saving of time. But while it is true that running bond can be built somewhat quicker than English, the writer claims that the advantage gained in this respect is so small as to be altogether inadequate to compensate for the great decrease in strength. It may be added, that, when he has urged architects to specify English and Flemish bond, he has been told that builders would refuse to construct them without an exorbitant increase of cost, being actually bound by the journeymen bricklayers to lay only the system of bonding they have been used to. This idea is doubtless exaggerated because no small proportion of working bricklayers are foreigners and are well acquainted with the correct methods of laying English and Flemish bonds.

But whatever bond is used in the construction of walls, there are certain other points of importance that are only too frequently overlooked. The first of these that may be mentioned is "damp courses." In Europe the use of damp courses is rendered compulsory by the building laws in most large cities. A damp course, if constructed of proper materials, is absolutely effectual in preventing the rising of moisture by capillary attraction from the earth and the consequent dampness of the walls.

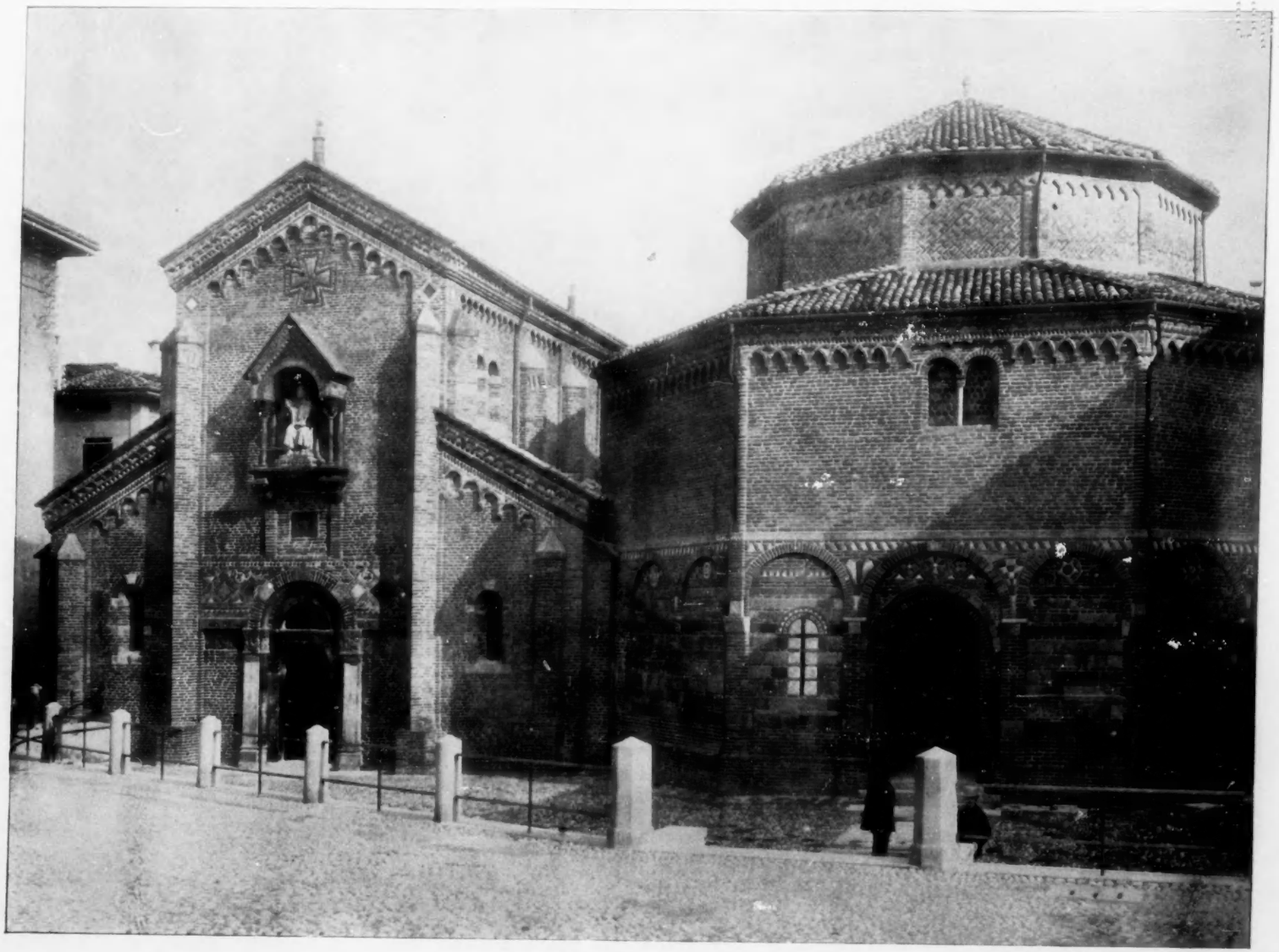
"How to cure damp walls" is a question that is propounded to the architects' and builders' journals very frequently by house owners and others who are suffering from this trouble, and who not infrequently state that they have tried the application of various kinds of paint to the surface of the walls with the only result of driving the moisture higher up the wall. In such cases an effectual remedy may be found in inserting damp courses throughout the wall, underpinning it as may be necessary, although, of course, the damp course should have been inserted when the wall was built.

A good damp course may be constructed of three layers of common roofing slates, laid in cement with the joints lapping, the edges of the slates projecting to about an inch or so beyond the side of the wall. The damp course, of whatever kind it is, should be put in just above the ground line. A layer of Portland cement (that is, cement mixed with water without the addition of sand) spread over the surface of the wall, to the thickness of three fourths of an inch, makes a very effective damp course, as does also a layer of bituminous asphalt laid in the same way. Sheet lead is also used and possesses the advantage of yielding somewhat to the inequalities of the brick or stone, and by that means distributing the weight more equally over the area. Damp courses may be constructed of other materials: in fact anything that is absolutely impervious to moisture and may be applied to the thicknesses of the walls is suitable.

While the fact that damp courses are very little used can but occasion surprise to those who have had an opportunity of having seen them in constant use, the fact that hollow or cavity walls are so little used is even more surprising. Brick buildings, when standing in isolated positions, may always be erected with advantage with a cavity wall, because any moisture passing through the outer casing cannot find its way into the interior of the building. Cavity walls are constructed of what are practically two walls, built side by side parallel and at a distance apart of about two inches, the two casings being closely tied together either by bricks, or by iron ties specially made for the purpose and inserted in every fourth course at a distance apart of about two feet six inches. The wall, from the foundation up to the ground line, is built solid, and on the top is formed a damp course upon which two cavities are built. The portion between the cavities thus forms a gutter and is constructed with a fall so as to allow any water that may find its way in to run down the drains with which the cavity is connected. Sheet lead or sheet zinc is inserted over all door and window openings. In the case of brick-and-a-half walls, which consists of one brick wall and a half brick wall, connected as described, it will be a subject for consideration as to whether a thicker or thinner casing should go on the outside. As a rule a thicker is preferred on the exterior, as it offers the greater resistance to the moisture finding its way in; but in any case it is well to observe that the floor and roofing timbers should always rest on the thicker casing.

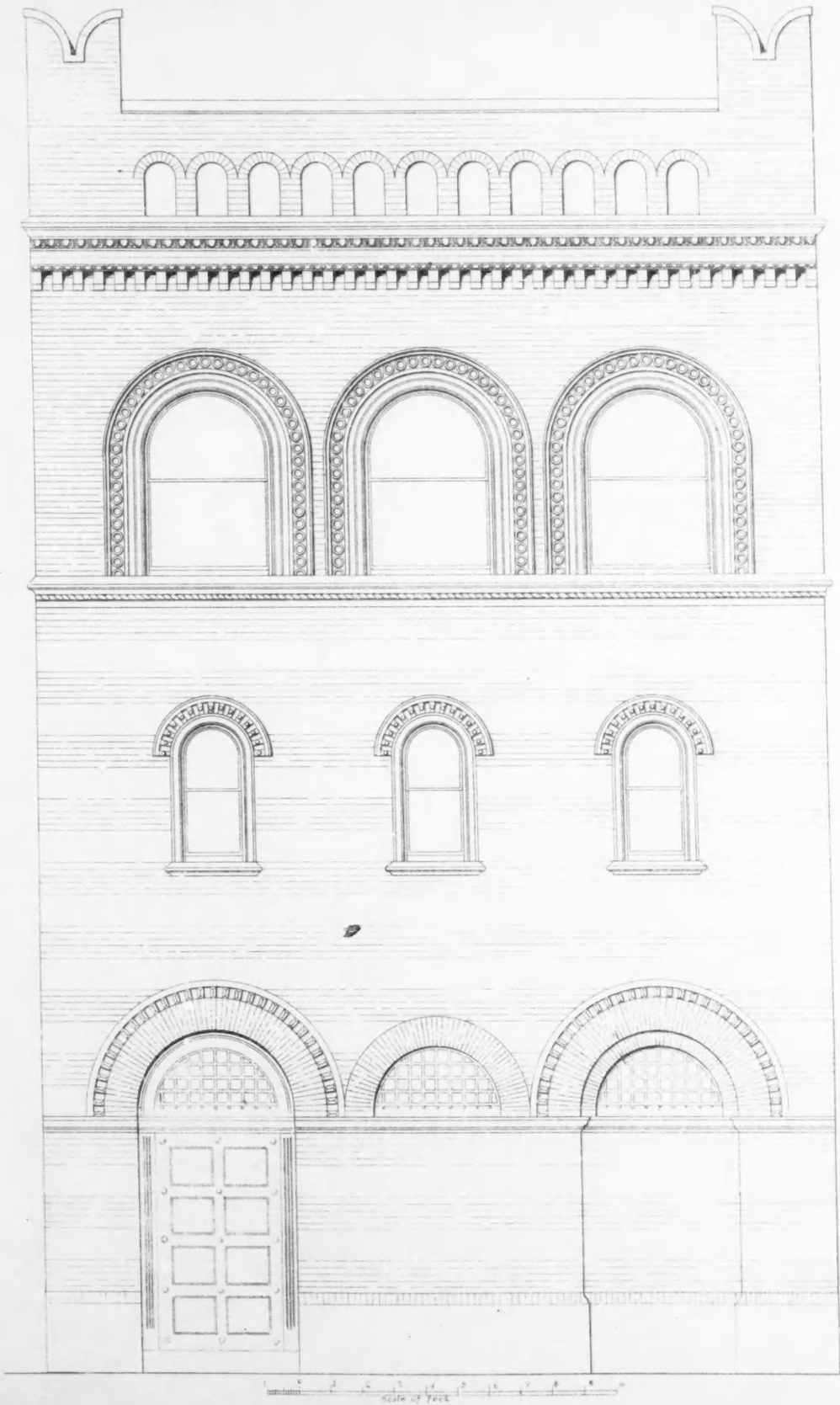
One of the most important advantages of hollow cavity walls is the important influence it has on the temperature of the house. The two inch space of air in the centre of the wall acts as a sort of a non-conductor, and the variations in the atmosphere are not felt to anything like so great a degree as they are when the walls are built solid. In other words, houses built with these walls are warmer in winter and cooler in summer.

Another point of construction that may be referred to is the hoop iron bond; this costs so little and adds so much to the strength of the brickwork that it is difficult to understand why its use has not become more general. Hoop iron used for this purpose is about an eighth of an inch thick, and one and a half inches broad. It is laid in every fourth course right along the wall, one row of hoop iron being



OLD BAPTISTRY OF S. STEFANO, BOLOGNA.

First of a Series of Photographs of Foreign Brickwork.



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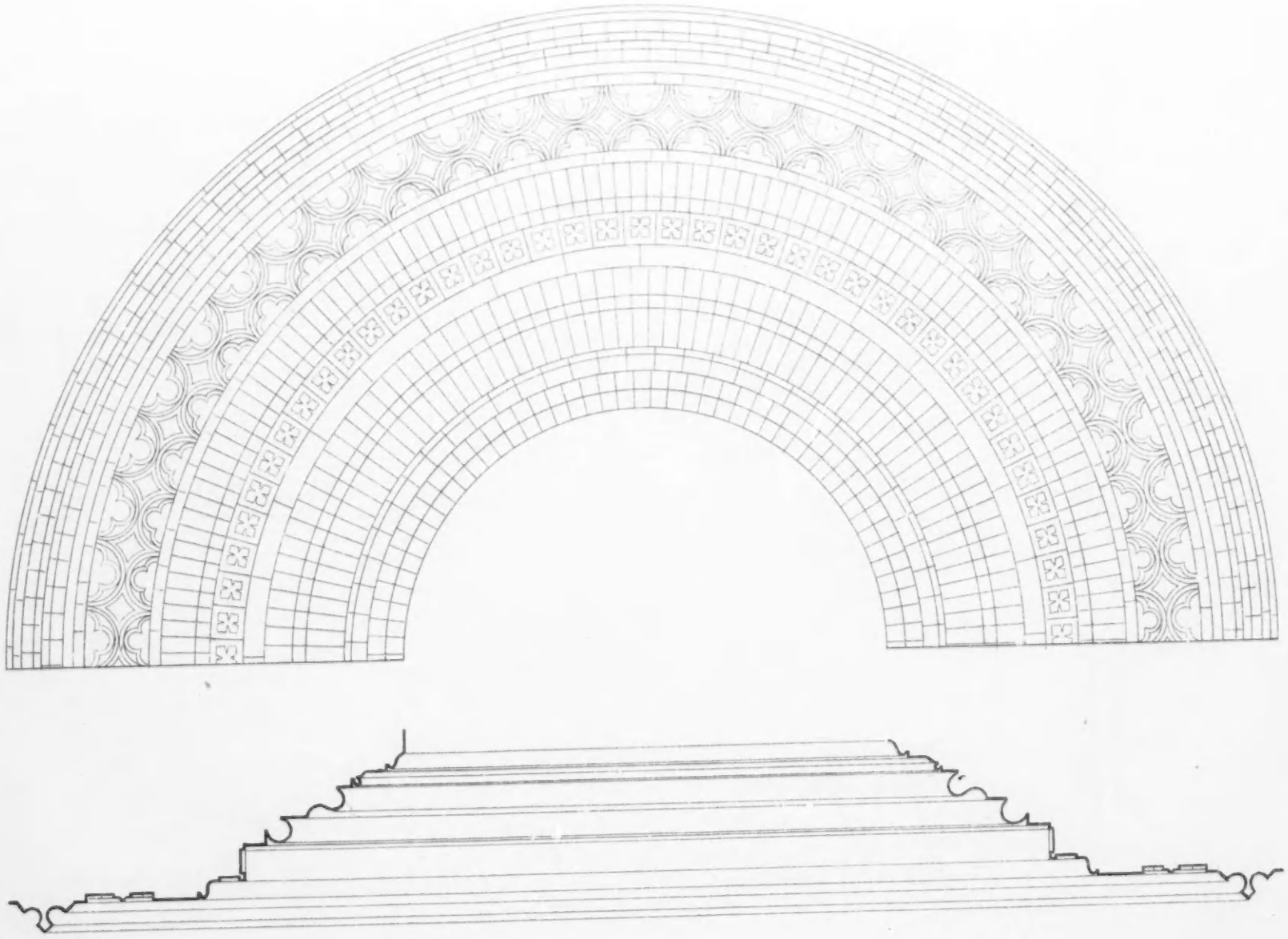
CARL FEHMER, ARCHITECT, BOSTON.



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CIRCULAR WINDOW FROM BROLETTO AT BRESCIA.

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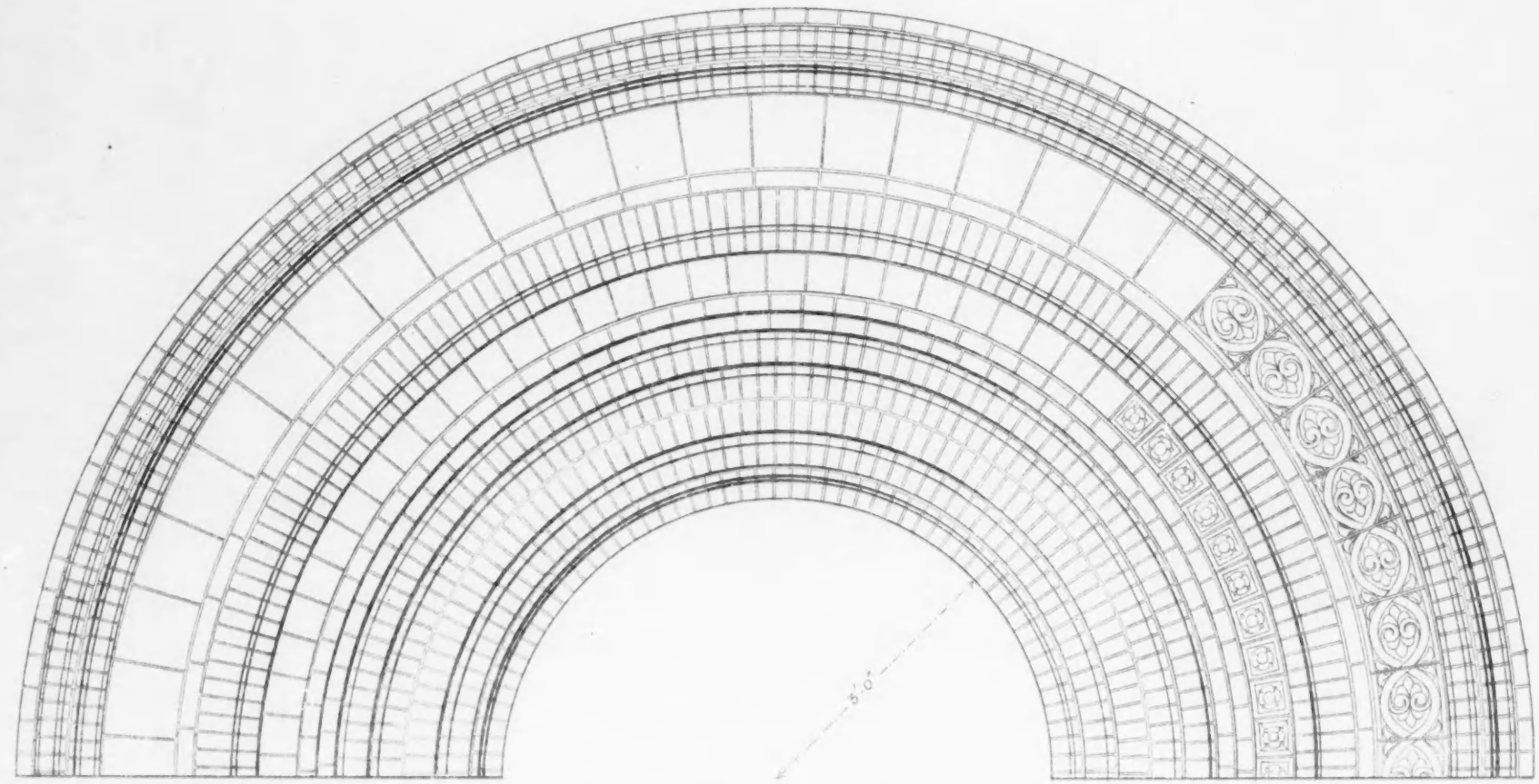

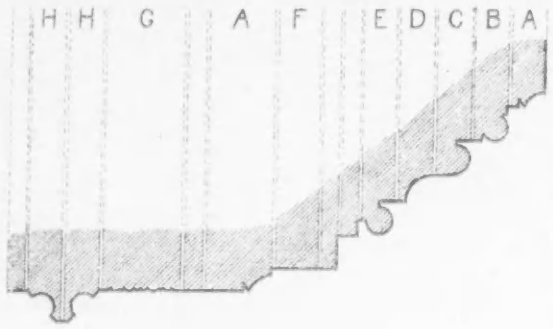

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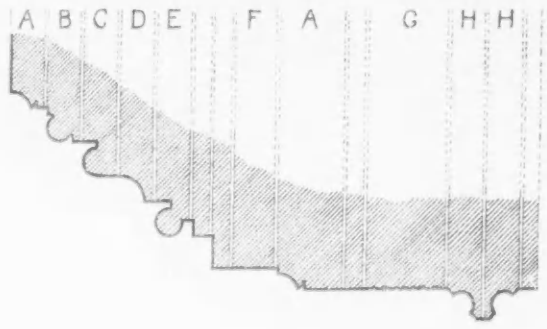

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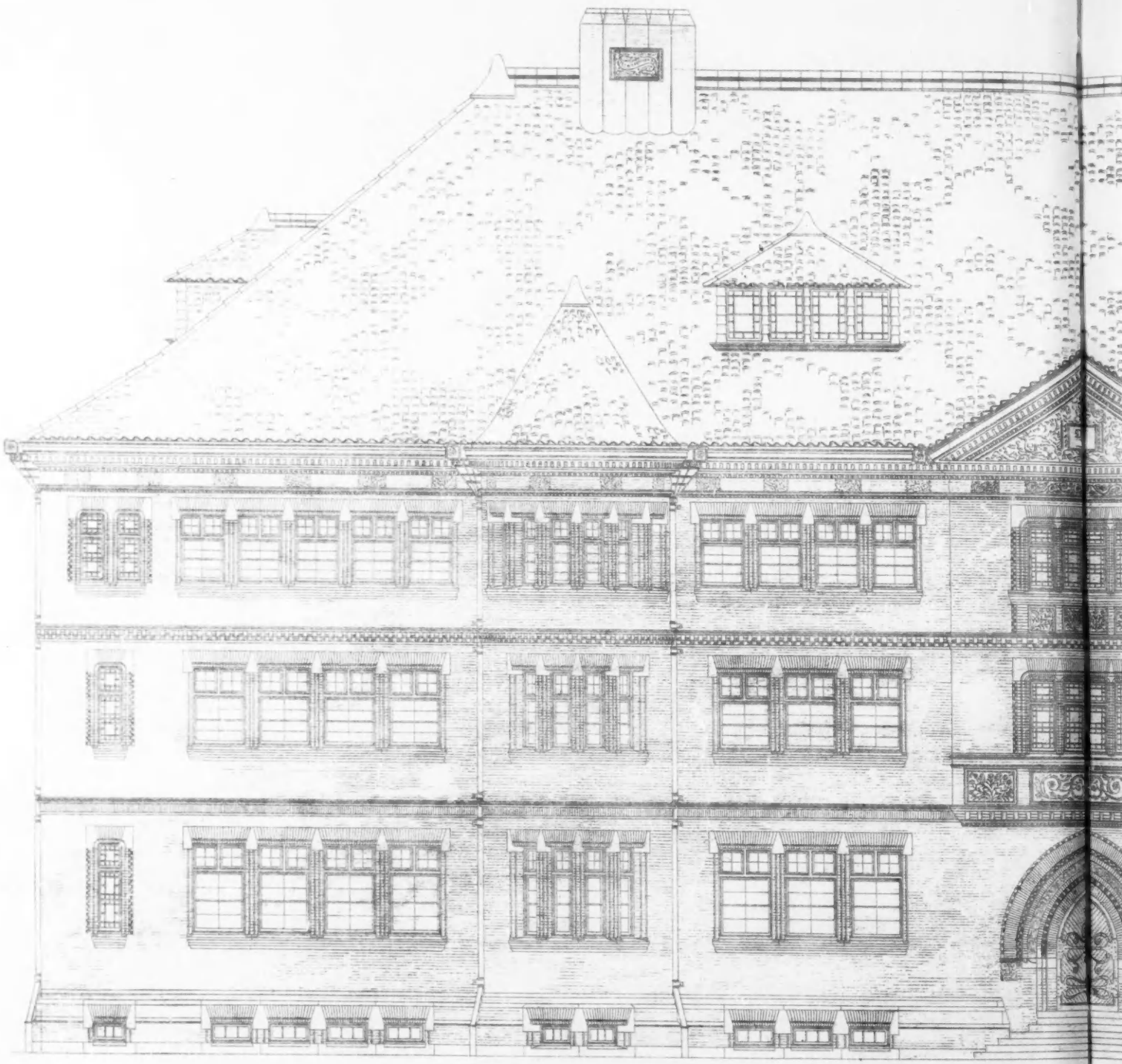

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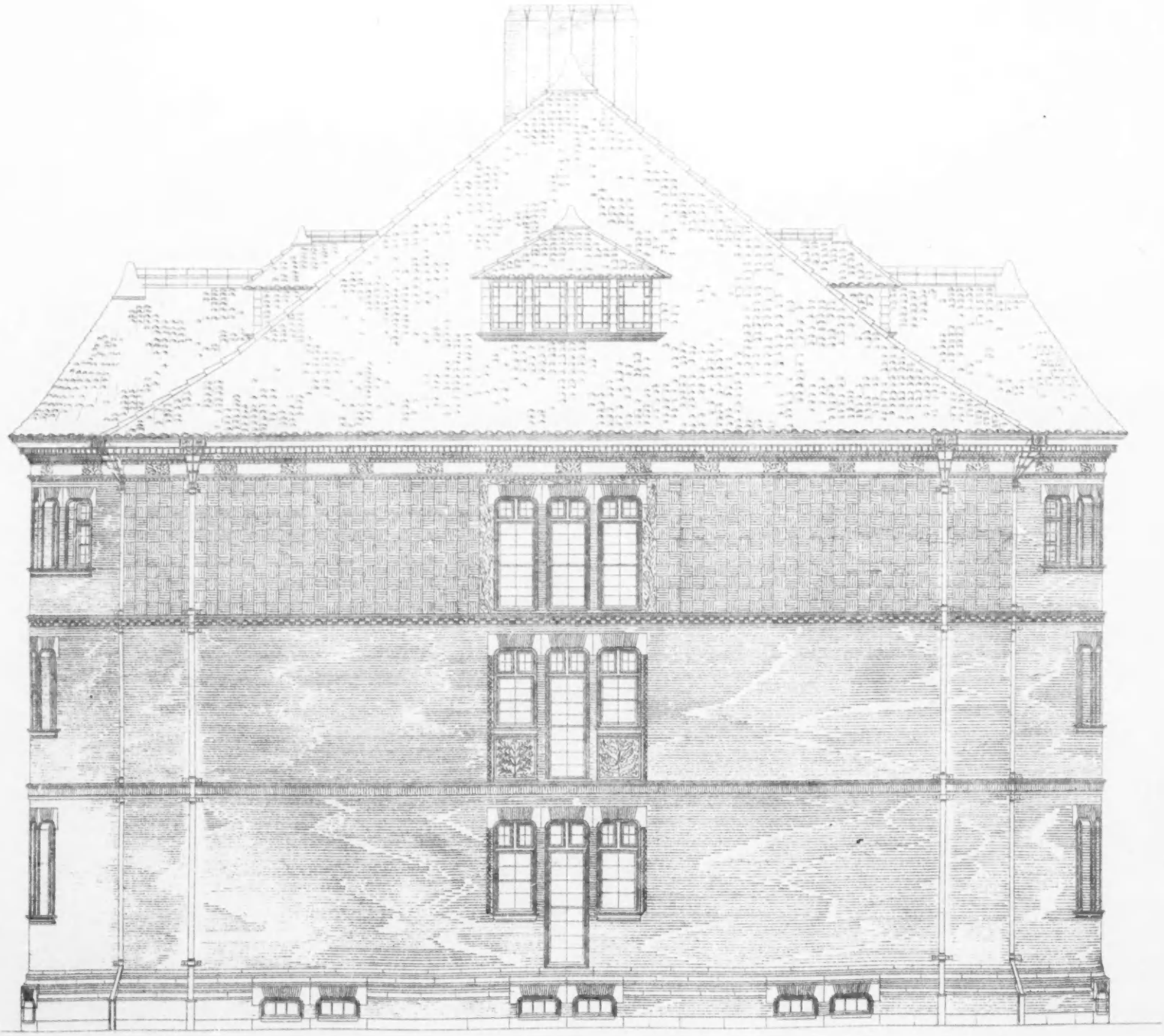

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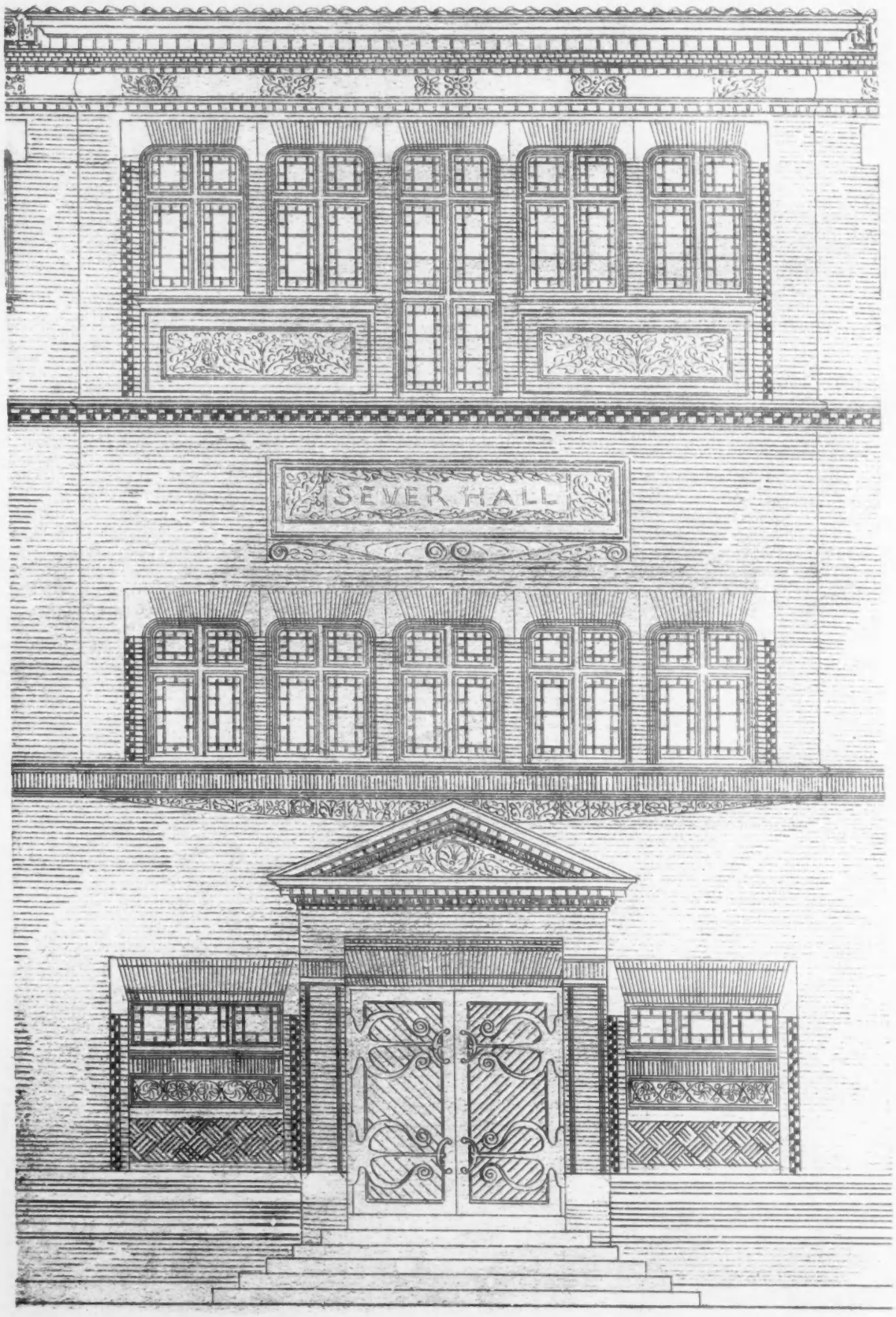

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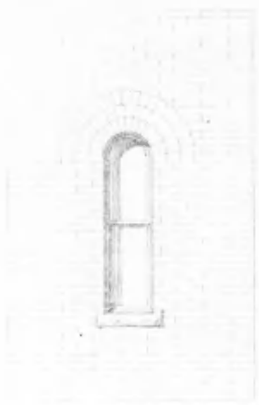

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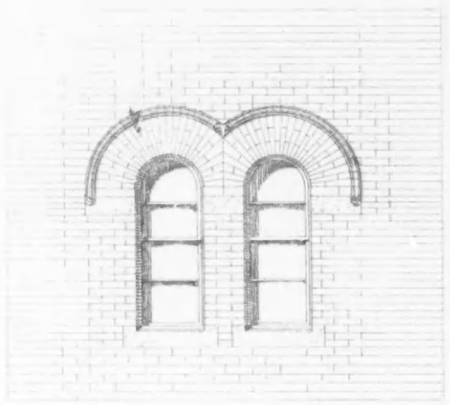

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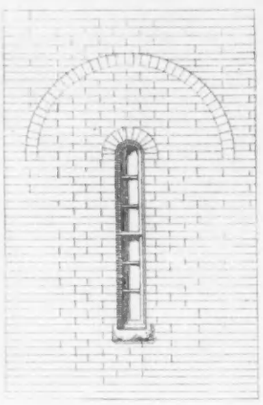

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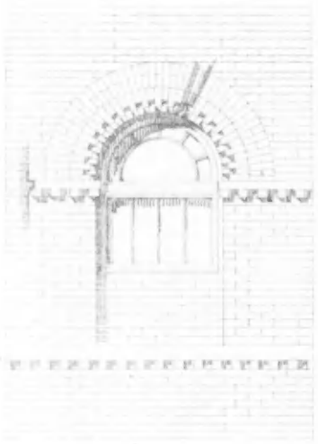

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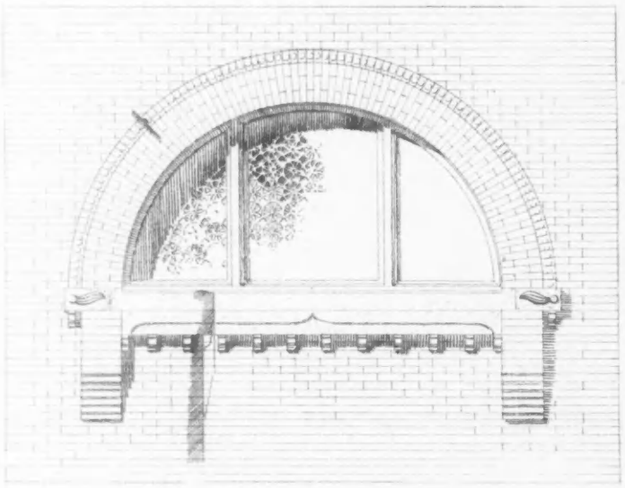

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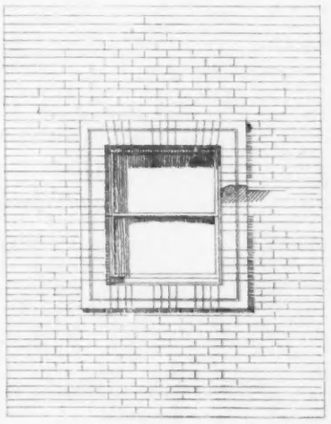

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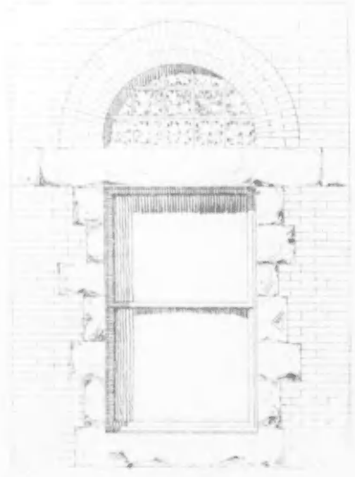

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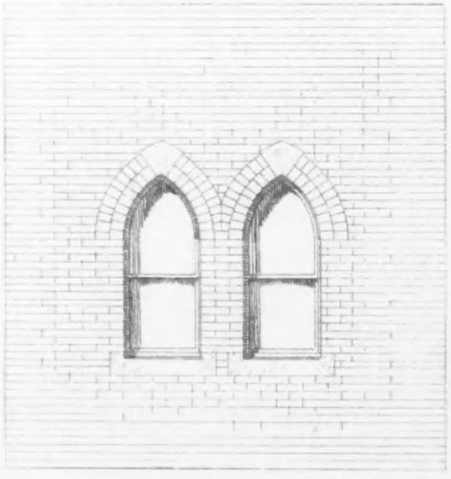

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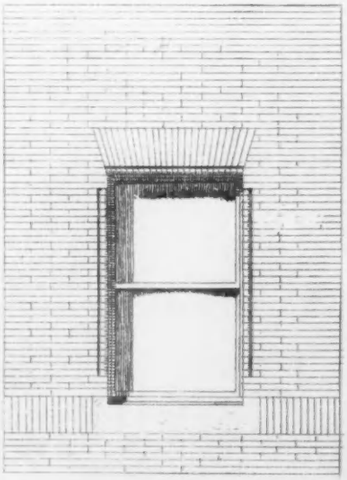

TRINITY PARSONAGE.

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SOME BOSTON WINDOWS.

inserted for each half brick in the wall's thickness; the hoop iron is riveted at the angles. In order to prevent the iron from rusting, it is covered with tar or zinc. The edges are generally jagged with the object of getting a better grip of the mortar, and the hoop iron holds the wall together and assists in distributing the weight and is in every way desirable. Its cost is little, and the work it does great.

The writer, in preparing the above, has only referred to one or two of the more important directions in which it would appear that an improvement might be made in the construction of brickwork. Architects and builders have now better facilities for producing perfect brickwork than they ever had in the history of the world; and they should make it a matter of pride to see that the most perfect building material approaches as nearly as possible to perfection in construction. ARTHUR SEYMOUR JENNINGS.

COLORED GLAZES ON TERRA-COTTA.

Italians in general know little of the arts and how they were followed abroad after the fall of the Roman Empire, but seem to think that art of every kind had no existence anywhere but among themselves. No wonder, then, that Vasari, though wrongly, claims for Luca della Robbia the honor of being the inventor of applying colored glazes to burned clay, and the only artist in it at the time. The art of fixing by fire upon clay, sun-dried, if not already baked, the two sorts of glaze, the colorless and the colored, was well understood among the more cultivated nations in Europe, Asia, and Africa from remote antiquity. Spread with great niceness, either partially or entirely, over those admirably figured and beautifully shaped fictile vases which Greece wrought at home or by the hands of her colonists in Italy and Sicily, as well as upon that finer kind of hardware now generally known as Samian, do we observe a delicate, thin, colorless, transparent mineral glaze. A coarser sort of glazing was used by the Romans, who have bequeathed us such a mighty heap of potsherds on the banks of the Tiber as to merit its present name, Monte Testaccio. At a very early period the Egyptians ornamented many articles with a colored glazing. In the Middle Ages, as early as the eleventh century, upon those fine belfries to the churches at Rome, and built during that period, do we see let into the brickwork those curious large, round, concave pieces of hardware that glisten again as bright as ever, with their bright gum glaze, even now. Later, the art was brought to great perfection by the Saracens, and carried with them wherever they settled themselves around the basin and in the islands of the Mediterranean. Under these the South of Spain won for itself great reputation for its works in burned glazed clay, and more especially for its tiles, which, from being at first usually tinted with a bright purple glaze, bestowed their own specific name, Azulejos — just as Faïnza did to pottery in France—upon tiles of all sorts, and as a generic denomination. Those who have seen the beautiful Alhambra must recall to mind how several of its splendid halls are floored with these same tiles, still bright, and their walls in part skirted, after a very tasty pattern, with cubes of various colors, in the same material. But in Tuscany itself and not long before, Jacopo della Quercia had employed a glazing, a colorless glazing, it is true, but yet a glazing, upon burned clay. Here, in England, the glazing by fire of sun-dried clay tiles, especially for church decoration, was known and followed at an early period; and the specimens that have come down to us from the thirteenth century, and found at Chutsey, Castle Acre, Woodpery, and several of our other old churches and minsters, show not only a great elegance in design, but disclose the process used in making them. While yet the well-fined and kneaded clay was soft enough, the design was deeply struck into the face of the tile by a stamp, and the hollow thus struck filled up with white pipe clay. Over all this was floated a metallic yellow glaze that in the firing gave to the red a warm, full tone, and a rich, golden hue to the pattern done in white clay. In Germany the same art, after a simpler way, was practised. The "Acta Sanctorum," by the Bolandists, furnish us with the cenotaph raised in the old cathedral at Hamburg to the memory of Pope Benedict V., who died A. D. 965; and after the fashion of our English high tombs, its sides are skirted with glazed tiles, figured with sacred subjects and the persons of the apostles, the figures being white upon a green ground. Such a method was, therefore, very old and widely spread. While refusing, then, to recognize in Luca della Robbia the inventor of colored glazes as applied to burned clay, we must not, cannot rob him of the glory of being the first to use them with such new, such bold, such marvellous effect. — *The Architect.*

MEDIÆVAL BRICKWORK.

In the Middle Ages brick was used in place of stone in certain districts where stone was hard to get. These districts were widely separated, and though their architects knew what was generally current in architecture in their own neighborhood, it is most probable that they knew nothing of how other men who had to use bricks used them, and trusted in each case to their own good sense and skill to adapt what they knew of art to the material. The brick-building districts in the Middle Ages were mainly these: the North of Germany and the shores of the Baltic, Belgium, the district round Toulouse, the North of Italy and a large part of Spain, but especially the district between Zaragossa and Toledo. Now these districts are all far apart, but certain customs are found in all of them. The bricks are usually long and thin, made of well-tempered clay and hardly burnt, laid in thick beds of mortar, and frequently moulded with much care; in almost every respect, therefore, unlike the modern material. Everywhere, also, the habit of moulding bricks led to the frequent repetition of the ornamental features, and so to a really distinct style of art, quite unlike what would ever be thought of in the case of stonework. Up to a certain point, therefore, there was similarity of some kind. But in matters of detail, there were great differences. Look, for instance, at such a fundamental question as the mode of construction of an arch; in Italian examples it will be found that brick arches were constructed on a principle entirely unlike anything we ever see in England of the same period. The bricks are so disposed around the arch as to radiate, not from one centre, but from many; so that, instead of a wedge-shaped key in the point of the arch, we have a vertical joint, to which all the bricks accommodate themselves. Precisely the same peculiarity is seen in all the brickwork of Moorish architects, with the additional feature that the radiation of the joints began usually above the base of the arch. In German and English brickwork these features are never seen. So, again, in the formation of a cusp, the German, as a rule, moulded a whole cusp, and filled in his horizontal brickwork against it; whilst the Moor contrived in an entirely different fashion by building some of his cusps with horizontal courses cut to the required outline at the ends, and confining the arch bricks to the upper cusp. The Italian made his cusping by sometimes moulding his cusps, and sometimes cutting them, and sometimes again by an ingenious combination of cut bricks and stone. Analogous to these peculiarities is the constant use of the keystone to a pointed arch in Italian work, and the obvious repugnance to it in all work in the North of Europe, or again the practice, almost confined to Spain and Italy, of increasing the depth of arch voussoirs or arch bricks as they approach the centre of the arch, so that the soffit and back of the same arch are not concentric. In such cases we may accept any such variation as long as it is clearly not inconsistent in principle with the object of the work; and undoubtedly the more old examples are studied, the more these instances of variety will be found, which are not adduced as suggestions for copying, but as examples of the large and wide opening for original treatment of detail when it is done honestly and reasonably. In fact, the openings for such originality are just as great now as ever they were.

TERRA-COTTA IN BUILDING.

The artists of the Roman period made free use of clay wherever it came to hand more readily than stone. They learnt not only to use it in regular layers of brick, as we do, but to mould it to all the elegances of ornamental form, all the details of rich architraves, capitals, friezes, and engaged forms of sculpture. In some cases, as in the Amphitheatrum Castreuse and the temple of the god Redículus, the material was wrought into form by the chisel. In modern Rome, as Hope pointed out in his "History of Architecture," very great use was made of brick until a period comparatively recent. Of the grand Farnese Palace begun by Bramante and finished by Michael Angelo the plain surfaces are of brick, though so exquisitely laid and of a texture so delicate as to be taken by the superficial observer for stone. On this side of the Alps clay has never been moulded into forms to rival those of Italy. Still, in the South of France, particularly at Toulouse, remarkable examples are to be seen. In the valley of the Elbe, where the same deficiency of stone compelled a resort to the use of brick, there was never any approach to the refined ingenuity of Northern Italy. At Lubeck, however, the cathedral and the church of St. Mary are respectable specimens of

the style. In the Marien Kirche, at Brandenburg, ornamentation is carried to excess. Hanover and other towns furnish picturesque examples, some of which may be seen in Mr. Fergusson's "History of Architecture." England at one time possessed a brick architecture of no mean merit. If less inventive in form or less rich in ornamentation than foreign models, it was at least simple, natural, and eminently fitted to the climate. Many a fine specimen of the old English grange, or of the more stately mansion of the Tudor and Stuart periods, still perpetuates a native type of architecture singularly suggestive of comfort. To the high fiscal duty and its ensuing restrictions is mainly due the degradation of brick in more modern time. The villanous imposture of stucco, aided by the contract system of building, completed the ruin of the style. The legal English brick became at once the least desirable and the most unsightly material that any country could show — the type of all that was bare, mean, ugly, and false. It was especially in the plains of Lombardy, where building stone is rare, that the great impulse was naturally given to the use of natural earths for building purposes. There, in edifices of the highest architectural importance, we find clay during a long period not only used for the purpose of solid construction, but also moulded into forms so exquisite as to take its place as a material of high value and dignity in art. So rich is Lombardy in early works of terra-cotta as to be fitly called by Hope "the great country of brick." Among the most ancient remains of the kind, M. Ottolini calls attention to the crypts of the church of Lenno, on the Lake of Como. There sundry relics are still extant of colossal statues in terra-cotta "of a close-grained and tough consistency," all of which the writer considers clearly to belong to the construction of Christianity. The use of terra-cotta followed the fortunes of successive schools of art in Italy. Both in sacred and secular architecture it enables us to trace the development of taste. The golden period of the art was marked by a wise sobriety and simple severity of ornament, with a scrupulous care to confine the material within its appropriate limits of style. In the hands of the gifted architects who flourished along with Lucca della Robbia, the pre-eminent modeller in terra-cotta, ceramic ornament entered into all that was purest and most noble in the arts of design. Crema, Chiaravelle, and, above all, Pavia were the headquarters of this graceful school. At Milan, in the Ospitale Maggiore and the Castiglione Palace, were exhibited the arabesques and medallions of the cinquecentro period. In the subsequent age, in the hands of the so-called imitators of Michael Angelo, art, overpassing the boundary line of truth, lapsed into exaggeration. The severe, modest, and delicate beauty of terra-cotta refusing to lend itself to the contortions and imitative tricks of the barocco or rococo style, the entire art soon fell into decay and eventual oblivion. — *The Architect.*

BRICKWORK IN THE TROPICS.

Bricks, when stones cannot be obtained, must of necessity be used for certain descriptions of work in the tropics. Great caution should be exercised in their selection, as it is found that all bricks made near the seaboard with brackish water are exceedingly susceptible to the weather, and moulder rapidly away when exposed. It is, therefore, advisable to make them at some distance from the coast, with fresh water, and, above all, to have them well and thoroughly burned, which, in these climates where fuel is generally most expensive, is most difficult to insure. Near to the seacoast in Brazil it is found necessary to protect all brickwork with plaster, which certainly serves its purpose exceedingly well. In the interior of the country well-burnt bricks may stand for a few years, but ultimately it will be necessary to plaster them, or to give them a thick coat of whitewash from time to time. Tar, over a coat of whitewash, has been used with considerable success for the protection of brick buildings and other works of this material; and in localities where it would not be considered unsightly, it is certainly preferable in buildings on the side from which the prevailing winds and rains set in during the wet season, as it not only throws off the moisture on the outside quicker, but tends to keep the interior of the building freer from moisture than any other outer protection. Of two samples of brick taken from the same wall, built in 1790, in Recife, although not in any way protected by plaster or lime whitewash, one appears to be quite perfect, while the other is rapidly decaying, and shows the necessity of outward protection as a general rule, owing to the all but impossibility of obtaining in large quantities thoroughly well-burnt bricks.— *The Architect.*

EGYPTIAN CONICAL BRICKS.

In the British Museum are certain conical bricks of baked red terra-cotta, internally black, but red on the exterior, in length about nine inches and three inches diameter at the base, on which are stamped in relief hieroglyphs the names and titles of a deceased, to whom they are said to be dedicated. They are found about the tombs of Thebes, especially those of the Drah Abu'l Neggah. Their use is unknown, but various opinions have been formed on the subject. As they often exhibit a red or white color at the base, it has been supposed that they were used as stamps, or, as they increase in numbers in the ground as the entrance of each tomb is approached, it has also been supposed that they were employed to mark the sepulchre itself and the adjacent ground which belonged to it. So close to one another, indeed, are the sepulchres of the Drah Abu'l Neggah, that these cones appear to have been almost unnecessary. It is, however, possible that they may have been used for some architectural construction, like the smaller cones of yellow terra-cotta used in the walls of Warka, worked in an ornamental pattern of brickwork. Commencing with the eleventh dynasty, and continuing to be used in great numbers till the close of the eighteenth dynasty, they became rarer after the age of Rameses, and their use almost discontinued at the time of the twenty-sixth dynasty, later than which none are found. Representations are very rare upon them, inscriptions in horizontal or perpendicular lines being chiefly employed. Rectangular and other bricks are found stamped in the same manner. These are so rare that the use of kiln-baked bricks prior to the Roman period of the first century A. D. has been denied. These bricks may have been used as trial-pieces of the stamps of the cone.

A movement of some importance to the young architects and draughtsmen of Pennsylvania has just been started by the School of Architecture of the University of Pennsylvania. The idea is to found a travelling scholarship in architecture, which will give to one promising draughtsman every year the advantage of a twelve-month of travel and study in Europe. Any draughtsman resident in Pennsylvania will be allowed to compete, and it is expected that the first examination will be held, and the first man sent abroad, next spring. To give the scholarship a solid foundation $20,000 will be necessary, yielding an annual income of $1,000. A good start has already been made towards the securing of this money. The architects of Philadelphia have given the plan their hearty indorsement, and it is hoped that the co-operation of the profession throughout the State may also be secured.

In order to excite public interest in the object and to aid in raising the necessary endowment fund, an exhibition of the drawings made in competition for the Rotch, McKim, and Columbia College scholarships is to be held at the Pennsylvania Academy of Fine Arts, together with some of the work of scholars while abroad. Such an exhibition should be of the greatest interest, and should aid materially in increasing the endowment fund, which is to be raised by subscription. The rapid increase in the number of these scholarships since the Rotch scholarship was founded in Boston in 1884 is a most encouraging sign, and must have great influence on the future progress of our architecture.

Under a new law passed at Albany the various building bureaus of New York City are to be united in a Building Department. The mayor has given his support to the plan, and with the united action of architectural and building fraternities it is highly probable that this much-needed reform will become a fact. At present, building operations in the city of New York suffer serious inconvenience through being under the control of three separate bodies, none of which are themselves independent, but portions of other departments. There is a bureau of buildings in connection with the Fire Department, and bureaus of plumbing and light and ventilation in the Health Department. The superintendence of buildings in a great city should be of sufficient importance to require a distinct organization of its own. The present arrangement entails very considerable extra expense through the duplication of plans and much loss of time and unnecessary journeys between different parts of the city. The item of cost of drawings is alone sufficient reason for establishing the new department, while much more thorough and satisfactory work must result from placing building operations under the control of an inde-

pendent organization with its own employees and its own head directly responsible to the mayor. Much of this responsibility is lost under the present system, in which closely connected parts are widely separated, and one of the most important objects of municipal care treated as minor parts of other departments with which, properly speaking, they have no organic connection. It is sincerely to be hoped that "practical politics" will not prevent this very necessary reform from becoming really effective. — *The Engineering Magazine.*

BOOK NOTICES.

ZIEGELBAUWERKE DES MITTELALTERS UND DER RENAISSANCE IN ITALIEN, nach Originalaufnahmen herausgegeben von Heinrich Strack, Professor an der Königlichen Technischen Hochschule und der Königlichen Kunstschule in Berlin. Berlin, Ernst Wasmuth.

This admirable collection of examples of the brick architecture of the Middle Ages and the renaissance in Italy is an unusually valuable addition to the documents illustrative of the best work of past times, now at the disposal of the architect. It is a work which every designer, at all interested in brick or terra-cotta architecture, will be anxious to add to his library. It is a large folio which contains, first, brief notes, which, though they do not profess to be complete, yet cover pretty thoroughly the more important brick and terra-cotta buildings in North Italy. Noteworthy points of these buildings are indicated, and there are brief historical notices with dates and references to other publications, in which drawings of the buildings mentioned are to be found, for these prefatory remarks are by no means confined to the buildings of which representations are given. The notes constitute in fact an outline arranged by localities of the history of brick and terra-cotta architecture in North Italy.

The plates which follow consist of measured elevations and details, beautifully rendered, in wash, and a number of photogravure reproductions from photographs of a large number of the more interesting of North Italian brick and terra-cotta buildings. The drawings are evidently made with great care and faithfulness. They are the work of pupils of Professor Strack working under his direction, and are the result of three successive trips of six weeks each made by the professor with a number of his pupils.

There is only one point in their work which we are inclined to criticise. The drawings are made by the pernicious method followed quite generally, we believe, in German schools, of representing the modelling by means of a series of light flat washes instead of by graded washes, with the result that instead of curved surfaces we have represented surfaces made up of a series of narrow flat planes. So that, for instance, a column of circular plan is represented almost as if polygonal, and the egg and dart mouldings appear as if chopped out in straight planes. But for this defect the drawings are beautiful examples of draughtsmanship.

EXAMPLES OF DOMESTIC COLONIAL ARCHITECTURE IN NEW ENGLAND. Compiled, photographed, and published by James M. Corner and E. E. Soderholtz, Boston Architectural Club, 6 Hamilton Place, Boston.

EXAMPLES OF DOMESTIC COLONIAL ARCHITECTURE IN MARYLAND AND VIRGINIA. By the same authors.

THE COLONIAL ARCHITECTURE OF MARYLAND, PENNSYLVANIA, AND VIRGINIA. Bates, Kimball & Guild, Boston.

Until recent years our interesting and simple architecture of colonial times, examples of which are scattered along our eastern seaboard, from Maine to the Carolinas, received but little attention. But of late it has become the fashion, a fashion which certainly has been of advantage to our domestic architecture in spite of many vagaries miscalling themselves "Colonial." The attention lately given to this style has naturally created a demand for books and photographs treating of the subject. No adequate historical treatment of our early architecture has yet appeared so far as we are aware; but the publications before us, besides being full of suggestion for the designer, bring together a mass of material which we hope may be made use of as a foundation for some historical consideration of the subject. The three portfolios, whose titles appear above, all consist of well-selected photographic views of the best examples of our early architecture in the localities named down to the beginning of the present century. In New England most of these buildings are of wood, though there are some, like the old buildings of Harvard College, which are of brick, and here we find some moulded brick used, all of which was imported from England. The best examples of colonial brickwork, however, are to be found in Pennsylvania, Maryland, and Virginia, though even here we find the more elaborate architectural features executed in wood. Most of this old brickwork is laid, it will be noticed, in Flemish bond, and in and about Philadelphia we find frequent examples of the decorative use of dark-colored over-burned brick, used as headers in connection with this bond, an example which has been followed in recent years, for instance, in the gate posts of the new gates at Harvard College. The publication of these works is most timely, and as they are attractively presented, well printed, and moderate in price, they should find a ready sale.

INTERCOMMUNICATION.

One of the aims which The Brickbuilder proposes to itself is to bring architects and brick manufacturers, as well as brick masons, into closer relationship, and as one means to this end it will open its columns to questions and answers, suggestions and criticisms, on all matters related in any way to the subject matter of the journal, whether practical or aesthetic. This department will be left entirely in the hands of our readers, and its value will depend on the interest they take in it. We have no doubt, however, that such an interest will be taken in it as will insure its great usefulness. We commend the department to architects, brick manufacturers, and brick masons, and urge them to make the freest use of our columns by sending any questions, suggestions, or points of interest which occur to them in the course of their daily practice and work, and as you, reader, whoever you may be, hope to profit by others' answers, we conjure you to reply to any question that may appear here, the answer to which your special knowledge enables you to give.

QUESTIONS.

1. Can any readers of THE BRICKBUILDER tell me of some book giving instructions for figuring on complicated and ornamental brickwork? I am a brick manufacturer and would like some treatise giving practical illustrations of estimating from architects' and builders' drawings. "A. R. F., *Vancouver, B. C.*

2. What is a cheap method of laying a damp course in brick buildings — one that will prove effectual and permanent? Can any reader give instructions and approximate cost?

"DAMP COURSE," *Bridgeport, Conn.*

CATALOGUES.

Sketch Book of the Philadelphia and Boston Face Brick Co., 4 Liberty Square, Boston.

This supplement to the catalogue of the company which issues it consists of a series of designs of varying excellence, principally for doorways, fireplaces, and cornices, showing applications of their brick. The sketches are very attractively made, and the designs, for the most part, are good. Designs, having the refinement of detail which these have, would be impossible without carefully designed and well modelled brick moulds, and the Philadelphia and Boston Company are certainly to be commended for the excellence of their brick mouldings. The preface to this "Sketch Book" states that the models and patterns were made by John Evans & Co., of Boston, the well-known architectural carvers, "after drawings by an experienced architect." The mouldings are, in fact, patterned more or less directly after old Italian originals. The catalogue shows the advantage of such a course, and we hope that other brick companies will take the hint and follow the example. If other manufacturers should get up other series of designs of their own, equal in excellence to these, we should look to see not only a marked improvement in the quality of brick architecture in different parts of the country, but an increased demand for moulded brick.

THE BRICKBUILDER COMPETITIONS.

We wish to again call attention to the series of competitions that this paper has instituted, and urge designers to enter them. We are exceedingly fortunate in securing as a jury Mr. Edmund M. Wheelwright, Mr. R. Clipston Sturgis, and Mr. H. Langford Warren, and the professional standing of these gentlemen insures not only absolute fairness in making awards but, what is equally important in competitions, intelligent judgment based upon a thorough knowledge of the principles of design and construction, and of brick design and construction in particular. It is our purpose to make these competitions as popular and profitable as possible, and to this end we invite suggestions from possible competitors, regarding selection of subjects, number and amount of awards, limit of time, methods of rendering,

etc. Before announcing a third competition, the subject for which has not been chosen, we would like to have some expression of opinion from our readers.

We would also say that no matter how few designs may be submitted, prizes will be awarded, providing the jury considers them at all acceptable. The decision of the jury, with criticism, will be published, together with the winning designs. In proportion as the number of competitors increases, the prizes will be increased, so as to make the award greater for winning against a greater number of competitors.

The matter of awarding special prizes to winners in a certain number of competitions is also under consideration, and should this be done, some system of averaging would be adopted so as to give the prize to the competitor showing the best general run of work. These competitions are not limited to subscribers, but are open to all designers, irrespective of age or location.

In our next number the awards on Competition No. 1 will be announced with criticisms by the judges, and at the same time the designs awarded first and second prizes in this competition will be published.

Competition No. 2 is for a two-story store front, the programme of which is fully announced in the February number; it is due the first of June.

SPECIAL OFFER.

To increase the circulation of THE BRICKBUILDER we have decided to offer a very liberal premium on new subscribers, and this is a chance for draughtsmen and architectural students to put in a little time outside of office hours to very good advantage. As THE BRICKBUILDER is of use to architects, draughtsmen, contractors and builders, brick masons and brick manufacturers and dealers, every town offers a wide field and good pay to an energetic solicitor. We give cash premiums. Write for particulars.

THE ILLUSTRATIONS.

Plate 17. Providence Street Elevation, Bay State Trust Company, Boston Carl Fehmer, Architect.

This simple and well-proportioned design is executed in pressed brick with moulded brick trimmings and bands in the two lower stories of a brownish old-gold colored brick which form a pleasing and quiet contrast with the red brick. The design is as delightful in color as it is charming in proportion. The only thing to be regretted is the existence of the ugly and meaningless ears at the top, a misuse of the old Guelf battlement, the excuse for which we are entirely at a loss to divine.

Plate 18. Circular Window from the Broletto at Brescia.

Plate 19. Circular Window designed with stock patterns of ornamental bricks after a window in the Broletto at Brescia.

We give in these plates another comparison of an Italian window, with its nearest modern equivalent in terms of the brick furnished by our best brickmakers. This time it is the half of a large bull's-eye window from the same building from which we took the pointed window given in our last issue. The Italian example is even unusually refined and graceful with its happy contrast of large and small mouldings, and its admirable proportion of parts. The most striking difference between the two is in the ornamental members, Gothic motives being both rare and poor in our brickmakers' catalogues. We notice also the inevitable monotony in the sizes of the bricks in the modern translation, and the variety which is characteristic of its Italian prototype. But the most instructive comparison is to be made in the case of the sections of the windows in which the greater refinement and variety of the ancient example is apparent.

Plates 20, 21, 22, 23. Sever Hall, Harvard University. The late H. H. Richardson, Architect.

These elevations and details of Sever Hall, probably the most elaborate and carefully studied of Richardson's designs for brickwork, have been reproduced directly from the working drawings kindly lent us by Messrs. Shepley, Rutan, and Coolidge. The building is one of the finest examples of modern brickwork in this country, and the dignified and admirably proportioned design has been so much and so often admired that it is quite unnecessary for us to point out its fine qualities. The walls are entirely of brick, except the foundation course and steps which are of granite, and the skewbacks of the flat arches and the chimney caps which are of brownstone. Moulded bricks and built-up dentils of various kinds are extensively used. The bricks used, except in the carved portions, are a special handmade common brick twelve inches long and about two and a half inches wide, a size of which Mr. Richardson was very fond, and which, as will be seen, differs both from the standard size and from the so-called "Pompeiian" brick. It is a brick the size of which is perfectly in harmony with the bold and massive scale characteristic of Richardson's work. The moulded bricks used are not pressed but are specially made, common bricks. The ornamental portions are all of carved brick, for which a fine pressed brick was used. The drawings here published show only the position but not the character or design of this carving. The roof and crestings are of red tile; the conductors and gutters are of copper. The central part of the east elevation (of which we publish a detail) is slightly bowed out in plan in the second and third stories.

Plate 24. Some Boston Windows.

We publish these merely as examples of some of the simpler windows to be found in current work. The plate may serve to indicate how much better is a simply treated brick opening than one in which the brick is combined in an ill-considered manner with stone.

The windows from West Chester Park and Columbus Avenue certainly show "what to don't." In the latter example either the arch or the lintel might have been well alone, but they certainly are unfortunate in combination. The little pair of windows from Warren Avenue show the unfortunate effect of a keystone in a pointed arch.

Supplement. Front of the Baptistery and Church of San Stefano, Bologna.

Our supplement in this number, the first of the series of examples of old brick architecture which we propose to present to our readers, shows the front of the curious series of seven churches generally known as San Stefano at Bologna. The oldest of the group of buildings is that to the right of our plate: the old baptistery, originally built in the tenth century, and subsequently altered in the twelfth, at which time a sepulchre was built in the interior, whence the name San Sepolcro, by which it is sometimes known. The columns which support the dome in the interior were at that time strengthened by brick piers. The other church shown in our plate is but little later than the baptistery; but the group of buildings was only completed, substantially as we now see it, late in the twelfth or even in the thirteenth century. The buildings have been recently restored, and have in the process unfortunately lost something of the charm of color they formerly had. The group includes two interesting cloisters, the Corte di Pilato, which dates from 1019, and which bears a strong resemblance to the Narthex of S. Ambrogio, at Milan, and the double cloister of San Gerusalemme. The latter is especially interesting, both from the arcade in two stories which surrounds it, and from the rich color of the enamelled tiles, which, in ever-changing variety of pattern, fill the tympanums of the upper arcades, and contrast most beautifully with the dark rich red of the brickwork and the brighter red of the tile roofs above, and the blue sky beyond. The front of the buildings, as shown in our plate, gives a variety of admirable and suggestive examples of brick cornices, very rich in effect, while made up of the simplest forms. It will be noticed that there is almost no moulded brick anywhere. The building is an example of the charming and rich effects to be obtained by the use of common brick, where there is sufficient variety in the size of the brick. Stone, as well as enamelled brick and tile, and common brick, are used in the various ornamental bands and diaper patterns. It is curious to note the extreme irregularity in the size of the brick, which, of course, were made by hand, and apparently without much regard to size or shape except in width. The bond is equally irregular; but as many of the brick are almost square, it is impossible to tell just where the bond is. The effect of the whole, rude as the workmanship is — and before restoration, it appeared much ruder — is exceedingly picturesque and attractive. Altogether the group of buildings is one of the most curious in Europe. Unfortunately the charm of quiet color our plate cannot reproduce.